Nuclear Data Section
International Atomic Energy Agency
P.O.Box 100, A-1400 Vienna, Austria

Memo CP-D/558

Date: 29 April 2009
To: Distribution
From: N. Otsuka, S Hlavač

Subject: **Dictionary 23 (Analysis codes) - ERCSN**
Reference: **Memo CP-D/512**

We have added two analysis codes

PGS	Extraction of the LD from primary gamma spectra
PES	Extraction of the LD from equilibrium particle emission spectra

into dictionary 23 for two level density derivation methods. The 3rd case was found during the compilation of two neutron data measured at the WNR facility of LANL [1, 2]. According to T. Ericson [3], their derivation is on the basis of an expression of variances of total cross sections (Ericson fluctuation):

$$\mathrm{var}\sigma_T = \left\langle \left(\sigma_T - \langle \sigma_T \rangle\right)^2 \right\rangle = \frac{2}{\pi \langle \Gamma \rangle \rho(E)} \sum_J \left[\pi \lambda^2 \frac{(2J+1)}{(2J_i+1)(2J_t+1)} \right]^2 \frac{1}{H(J)} \sum_l \left(T_l^J\right)^2$$

, where

σ_T	Total cross section
<Γ>	Average level width
ρ(E)	Level density of compound nucleus
J	Total angular momentum of compound nucleus
J_i	Total angular momentum of projectile
J_t	Total angular momentum of target nuclide
$H(J)$	Fraction of all compound nucleus levels with spin J
T_l^J	Transmission coefficient for projectile (orbital angular momentum l) coupled J

We would propose a new method code for this derivation to fulfill the Action 40 of the NRDC 2008 meeting.

Dictionary 23 (Analysis codes)

ERCSN	Extraction of level density from Ericson fluctuation

References

[1] V. Mishra *et al*., Phys. Rev. C**44** (1991) 2419, to be in EXFOR.14170.
[2] W. Abfalterer *et al*., Phys. Rev. C**47** (1993) 1033, to be in EXFOR.14184.
[3] T. Ericson, Phys. Rev. Lett. **5** (1960) 430, Ann. Phys. **23** (1963) 390.

Distribution:

a.mengoni@iaea.org
a.nichols@iaea.org
blokhin@ippe.ru
chiba@earth.sgu.ac.jp
claes.nordborg@oecd.org
ganesan@barc.gov.in
gezg@ciae.ac.cn
hasegawa@nea.fr
henriksson@near.fr
hongwei@ciae.ac.cn
jhchang@kaeri.re.kr
kaltchenko@kinr.kiev.ua
katakura.junichi@jaea.go.jp
kato@nucl.sci.hokudai.ac.jp
kirarlyb@atomki.hu
l.vrapcenjak@iaea.org
manuel.bossant@oecd.org
manokhin@ippe.ru
mmarina@ippe.ru
mwherman@bnl.gov
nicolas.soppera@oecd.org
nklimova@kinr.kiev.ua
n.otsuka@iaea.org
nrdc@jcprg.org
oblozinsky@bnl.gov
ogritzay@kinr.kiev.ua
otto.schwerer@aon.at
samaev@obninsk.ru
s.babykina@polyn.kiae.su
s.dunaeva@iaea.org
stakacs@atomki.hu
stanislav.hlavac@savba.sk
taova@exped.vniief.ru
tarkanyi@atomki.hu
varlamov@depni.sinp.msu.ru
vlasov@kinr.kiev.ua
vmclane@optonline.net
v.zerkin@iaea.org
yolee@kaeri.re.kr